

REMARKS

Claims 1 to 17 are all the claims pending in the application.

Applicants have amended the specification at page 13 to correct an obvious error.

The Examiner makes of record the telephone restriction requirement and applicants' election of the invention of Group I, claim 1 to 12 and 17. The Examiner requires that applicants affirm this election when responding the Office Action. Applicants hereby affirm this election.

The Examiner has objected to the specification under the first paragraph of 35 U.S.C. 112 as not being clear. The Examiner asserts that the specification is replete with terms which are not clear. The Examiner states that examples of some unclear terms are "inaccurate parentheses" which appear on the left side of each page close to line 25 and between lines 10 and 15.

Applicants disagree with this rejection.

The "inaccurate parentheses" which the Examiner refers to are random marks that appear in the left hand margin of the pages and are not part of the specification. The printed U.S. Patent Application Publication 2007/0173663 which corresponds to the present application does not contain the random marks that the Examiner refers to. Accordingly, applicants submit that anyone reading the present specification would not consider this marks to be part of the specification.

Claims 1, 2, 4 and 12 have been rejected under 35 USC 103(a) as obvious over JP 2000-308830 to Yoshiaki et al in view of U.S. 4,495,374 to Jones et al.

Applicants submit that JP '830 to Yoshiaki et al and Jones et al do not disclose or render obvious the subject matter of the present claims and, accordingly, request withdrawal of this rejection.

The present invention as set forth in claim 1 is directed to a process for production of a supported catalyst comprising the following steps in order:

(1) First step: a step of impregnating the carrier with a solution containing (a) at least one compound which comprises at least one element selected from Group 8, 9 and 10 elements of the Periodic Table (hereinafter referred to as "(a) group compound)," to obtain an impregnated carrier (A);

(2) Second step: a step of contacting the impregnated carrier (A) with an alkaline substance and (b) a compound containing at least one element selected from among gallium, indium, thallium, germanium, tin, lead, phosphorus, arsenic, antimony, bismuth, sulfur, selenium, tellurium and polonium (hereinafter referred to as "(b) group compound)" to obtain an impregnated carrier (B) (where the alkaline substance and the (b) group compound are contacted simultaneously or separately in order with the impregnated carrier (A));

(3) Third step: a step of contacting the impregnated carrier (B) with a reducing substance to obtain a supported catalyst (C).

Thus, applicants have amended claim 1 to more positively recite the contacting in the second step.

It is important to realize that the present invention is characterized by the order of supporting the respective elements. The results of the Examples and Comparative Examples of

the present application establish that the catalyst performance can be improved by supporting the catalyst components in the order as specified in the present invention.

The Examiner asserts that Yoshiaki et al teach impregnation of a carrier with an aqueous solution of a water solution of a palladium compound, and then bringing the impregnated carrier into contact with a solution of a barium salt. Afterwards, the palladium compound is reduced to palladium metal with a reducing agent to obtain the metal palladium-carrying carrier. See Yoshiaki et al in the Abstract, lines 7-11.

The Examiner states that Yoshiaki et al do not expressly teach impregnation of the carrier with at least one element selected from the (b) group compounds of claim 1, that is, from among gallium, indium, thallium, germanium, tin, lead, phosphorus, arsenic, antimony, bismuth, sulfur, selenium, tellurium and polonium.

The Examiner asserts that in a process of converting methane to a higher hydrocarbon, using an oxidative synthesizing agent, which according to the Examiner is a similar process to that of the present invention, Jones et al teach impregnation of a carrier with phosphorus and alkaline earth metals. See Jones et al at page 3, column 4, lines 52 to 55.

The Examiner argues that at the time of the present invention, it would have been obvious to a person of ordinary skill in the art to perform the process of Yoshiaki et al with impregnation of a carrier with phosphorus in view of the teachings of Jones et al. The Examiner states that the suggestion or motivation for doing so would have been to promote the stability of a synthesizing agent by adding phosphorous into the composition. See Jones et al at page 2, column 2, lines 55-

59. The Examiner further asserts that since the process is obvious to perform, its product, namely, a supported catalyst as recited in claim 12, will be obvious too.

Applicants disagree with this rejection.

The Examiner has not provided any evidence that the catalysts in the process in Jones et al for converting methane to higher hydrocarbons using an oxidative synthesizing agent could be used as catalysts to produce the acetic acid in Yoshiaki et al. Accordingly, one of ordinary skill in the art would have no reason to combine the teachings of JP 2000-308830 to Yoshiaki et al with the teachings of Jones et al.

Further, Jones et al specifically disclose at column 3, lines 5 to 9 that nickel and noble metals and compounds thereof have a deleterious catalytic effect and that the contacting process described in Jones et al should be performed in the substantial absence of such elements and compounds. Jones et al specifically recite in claim 1 that the contacting is carried in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt, Au and mixtures thereof. Since the compounds of group (a) of claim 1 of the present application include compounds of Ni, Rh, Pd, Os, Ir and Pt, Jones et al teach against the combination set forth in claim 1.

Moreover, claim 1 recites that the group (a) compounds are impregnated, that the alkaline substance and group (b) compound are then contacted simultaneously or separately in order with the impregnated carrier, and that a reducing step be conducted to obtain the impregnated catalyst.

JP 2000-308830 to Yoshiaki et al discloses, at paragraphs [0022] through [0024], that a carrier is contacted with a Pd compound and a compound containing a Group 14, 15 or 16 element at the first step, the carrier obtained in the first step is contacted with barium hydroxide

which is an alkaline substance at the second step, and the carrier obtained in the second step is subjected to reduction with hydrazine at the third step. JP 2000-308830 to Yoshiaki et al mentions, for example, in paragraph [0067], Te, which corresponds to the (b) group compound in the present invention, as a Group 16 element. JP 2000-308830 to Yoshiaki et al also mentions Sn, Pb, Sb, Bi and Se in paragraph [0067].

JP 2000-308830 to Yoshiaki et al also discloses, at paragraphs [0083] through [0086], that a compound containing a Group 11 or 12 element such as Au or Zn, which corresponds to the (d) group compound of the present claims, is also supported.

However, in JP 2000-308830 to Yoshiaki et al, (a) Pd, (c) Te and (d) Au or Zn are supported at the first step simultaneously or separately in optional order, but JP '830 to Yoshiaki et al does not teach or suggest that the alkaline substance and a Te compound, which corresponds to the (b) group compound in the present invention, are contacted simultaneously or separately in order with the impregnated carrier.

The catalyst of Jones et al is reduced during its use in the production of methane and can be regenerated with oxygen, but this reduction in Jones et al does not disclose or suggest the reduction set forth in the present claims.

Thus, the supporting order of the catalyst components as specified in the present invention is neither taught nor suggested by the combination of JP '830 to Yoshiaki et al and Jones et al.

Further, Example 1 and Comparative Example 1 of the present specification show that when the compounds of group (b) are loaded before the reduction step as in Example 1, it is

possible to shorten the catalyst preparation step compared to prior art production processes and that the obtained catalyst results in inhibited generation of a carbon dioxide by-product in the production of acetic acid. Neither Yoshiaki et al nor Jones et al discloses or suggests the effects of the present invention.

In view of the above, applicants submit that JP '830 to Yoshiaki et al and Jones et al do not disclose or render obvious the subject matter of claims 1, 2, 4 and 12 and, accordingly, request withdrawal of this rejection.

Claims 3 and 7 have been rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2000-308830 to Yoshiaki et al in view of U.S. 4,495,374 to Jones et al as applied to claim above 1, and further in view of U.S. 2,109,844 to Lazier.

Applicants submit that JP '830 to Yoshiaki et al, Jones et al and Lazier do not disclose or render obvious the subject matter of claims 3 and 7 and, accordingly, request withdrawal of this rejection.

Claims 3 and 7 are dependent claims that depend from claim 1. Accordingly, applicants submit that claims 3 and 7 are patentable over Yoshiaki et al and Jones et al for the same reasons as discussed above in connection with the rejection of claim 1. Further, the supporting order of the catalyst components as specified in the present invention is neither taught nor suggested by the combination of JP '830 to Yoshiaki et al, Jones et al and Lazier.

Still further, applicants disagree with the Examiner's argument that it would have been obvious to combine the teachings of Lazier with those of Yoshiaki et al.

The Examiner has not provided any evidence that the catalysts in Lazier for hydrogenating an ester to produce an alcohol and an ester of the alcohol could be used as catalysts to produce the acetic acid in Yoshiaki et al. Accordingly, one of ordinary skill in the art would have no reason to combine the teachings of JP 2000-308830 to Yoshiaki et al with the teachings of Lazier.

In view of the above, applicants submit that JP '830 to Yoshiaki et al, Jones et al and Lazier do not disclose or render obvious the subject matter of claims 3 and 7 and, accordingly, request withdrawal of this rejection.

Claim 5 has been rejected under 35 U.S.C. 1 03(a) as being unpatentable over JP 2000-30883 to Yoshiaki et al in view of U.S. 4,495,374 Jones et al as applied to claim 1 above, and further in view of U.S. 5,316,995 to Kaminsky et al.

Applicants submit that JP '830, Jones et al and Kaminsky et al do not disclose or render obvious the subject matter of claim 5 and, accordingly, request withdrawal of this rejection.

Claim 5 is a dependent claim that depends from claim 1. Accordingly, applicants submit that claim 5 is patentable over Yoshiaki et al and Jones et al for the same reasons as discussed above in connection with the rejection of claim 1. Further, the supporting order of the catalyst components as specified in the present invention is neither taught nor suggested by the combination of JP '830 to Yoshiaki et al, Jones et al and Kaminsky et al.

Applicants note that although the Examiner states that Yoshiaki et al and Jones et al do not disclose germanium, applicants point out that Jones et al, at column 4, disclose the use of germanium, tin, lead and bismuth, all of which are recited in claim 5.

Still further, applicants disagree with the Examiner's argument that it would have been obvious to combine the teachings of Kaminsky et al with those of Yoshiaki et al.

The Examiner has not provided any evidence that the catalysts in Kaminsky et al for converting hydrocarbons could be used as catalysts to produce the acetic acid in Yoshiaki et al. Accordingly, one of ordinary skill in the art would have no reason to combine the teachings of JP 2000-308830 to Yoshiaki et al with the teachings of Kaminsky et al.

In view of the above, applicants submit that JP '830 to Yoshiaki et al, Jones et al and Kaminsky et al do not disclose or render obvious the subject matter of claim 5 and, accordingly, request withdrawal of this rejection.

Claim 6, 7 and 8 have been rejected under 35 U.S.C. 103(a) as obvious over JP 2000-308830 to Yoshiaki et al in view of U.S. 4,495,374 to Jones et al as applied to claim 1 above, and further in view of U.S. 2003/0135069 to Fujita et al.

Applicants submit that JP '830, Jones et al and Fujita et al do not disclose or render obvious the subject matter of claims 6, 7 and 8 and, accordingly, request withdrawal of this rejection.

Applicants note that in the detailed statement of this rejection, the Examiner refers to "Denko et al." Applicants believe the Examiner intended to refer to Fujita et al.

Claim 6, 7 and 8 are dependent claims that depend from claim 1. Accordingly, applicants submit that these claims are patentable over Yoshiaki et al and Jones et al for the same reasons as discussed above in connection with the rejection of claim 1. Further, the supporting order of the

catalyst components as specified in the present invention is neither taught nor suggested by the combination of JP '830 to Yoshiaki et al, Jones et al and Fujita et al.

In view of the above, applicants submit that JP '830, Jones et al and Fujita et al do not disclose or render obvious the subject matter of claims 6, 7 and 8 and, accordingly, request withdrawal of this rejection.

Claim 9 has been rejected under 35 U.S.C. 103(a) as being obvious over JP 2000-308830 to Yoshiaki et al in view of U.S. 4,495,374 to Jones et al as applied to claim 1 above, and further in view of U.S. 2,109,844 to Lazier.

Applicants submit that JP '830, Jones et al and Lazier do not disclose or render obvious the subject matter of claim 9 and, accordingly, request withdrawal of this rejection.

Claim 9 is a dependent claim that depends from claim 1. Accordingly, applicants submit that claim 9 is patentable over Yoshiaki et al and Jones et al for the same reasons as discussed above in connection with the rejection of claim 1. Further, the supporting order of the catalyst components as specified in the present invention is neither taught nor suggested by the combination of JP '830 to Yoshiaki et al, Jones et al and Lazier.

Still further, applicants disagree with the Examiner's argument that it would have been obvious to combine the teachings of Lazier with those of Yoshiaki et al.

The Examiner has not provided any evidence that the catalysts in Lazier for hydrogenating an ester to produce an alcohol and an ester of the alcohol could be used as catalysts to produce the acetic acid in Yoshiaki et al. Accordingly, one of ordinary skill in the art

would have no reason to combine the teachings of JP 2000-308830 to Yoshiaki et al with the teachings of Lazier.

In view of the above, applicants submit that JP '830 to Yoshiaki et al, Jones et al and Lazier do not disclose or render obvious the subject matter of claim 9 and, accordingly, request withdrawal of this rejection.

Claim 10 has been rejected under 35U.S.C 103(a) as obvious over JP 2000-308830 to Yoshiaki et al in view of U.S. 4,495,374 to Jones et al as applied to claim 1 above, and further in view of WO 2004/056474 to Sakai et al.

Applicants submit that JP '830, Jones et al and WO '474 do not disclose or render obvious the subject matter of the present claims and, accordingly, request withdrawal of this rejection.

The Examiner states that Yoshiaki et al and Jones et al do not expressly teach using the catalyst in the reaction of a lower olefin and oxygen to produce a lower aliphatic carboxylic acid.

The Examiner asserts that in a process for producing a compound by using a catalyst, Sakai et al teach the production of a lower aliphatic carboxylic acid by a single-stage contact reaction of a lower olefin and oxygen. See Sakai at page 1, lines 23-26.

The Examiner asserts that at the time of present invention, it would have been obvious to a person of ordinary skill in the art to perform the process of Yoshiaki et al in view of Jones et al by using the catalyst to make a lower aliphatic carboxylic acid in view of the teachings of Sakai et al. The Examiner states that the motivation for doing so would have been to use this catalyst instead to see how well a product is made from olefin and oxygen

Claim 10 is a dependent claim that depends from claim 1. Claim 10 is a process claim that requires the process of claim 1. Accordingly, applicants submit that claim 10 is patentable over Yoshiaki et al and Jones et al for the same reasons as discussed above in connection with the rejection of claim 1. Further, the supporting order of the catalyst components as specified in the present invention is neither taught nor suggested in any combination of JP '830 to Yoshiaki et al, Jones et al and WO '474.

Further, applicants note that Yoshiaki et al disclose that the catalyst of Yoshiaki et al is used in a method of making a lower aliphatic carboxylic acid by a vapor phase reaction of a lower olefin and oxygen. Applicants do not see what WO '474 to Sakai et al adds to the disclosure of Yoshiaki et al.

In view of the above, applicants submit that JP '830 to Yoshiaki et al, Jones et al and WO '474 do not disclose or render obvious the subject matter of claim 10 and, accordingly, request withdrawal of this rejection.

Claim 11 has been rejected under 35 U.S.C. 103(a) as being obvious over JP 2000-308830 to Yoshiaki et al in view of U.S. 4,495,374 to Jones et al as applied to claim 1 above, and further in view of U.S. 6,552,220 to Obana et al.

Applicants submit that JP '830 to Yoshiaki et al, Jones et al and Obana et al do not disclose or render obvious the subject matter of claim 11, accordingly, request withdrawal of this rejection.

The Examiner asserts that Yoshiaki et al, Jones et al and Obana et al do not expressly teach using the catalyst in the reaction of ethylene and oxygen.

The Examiner relies on Obana et al for a teaching of producing acetic acid through reaction of ethanol and oxygen, and asserts that it would have been obvious to use the Yoshiaki et al catalyst for this purpose in view of Obana et al.

Although the Examiner states that Yoshiaki et al do not disclose using the Yoshiaki et al catalyst in a method of making a lower aliphatic carboxylic acid by reaction of a lower olefin and oxygen, the Abstract of Yoshiaki et al clearly discloses that the Yoshiaki et al catalyst can be used for this purpose.

In any event, claim 11 is a dependent claim that depends, ultimately, from claim 1. Thus, claim 11 is a process claim that requires the process of claim 1. Accordingly, applicants submit that claim 11 is patentable over Yoshiaki et al and Jones et al for the same reasons as discussed above in connection with the rejection of claim 1. Further, the supporting order of the catalyst components as specified in the present invention is neither taught nor suggested by the combination of JP '830 to Yoshiaki et al, Jones et al and Obana et al.

In view of the above, applicants submit that JP '830 to Yoshiaki et al, Jones et al and Obana et al do not disclose or render obvious the subject matter of claim 11 and, accordingly, request withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. § 1.111
Application No.: 10/591,002

Attorney Docket No.: Q85897

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Respectfully submitted,


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23373

CUSTOMER NUMBER

Date: February 9, 2009


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